

Message

---

**From:** Newhouse, Kathleen [/O=EXCHANGELABS/OU=EXCHANGE ADMINISTRATIVE GROUP (FYDIBOHF23SPDLT)/CN=RECIPIENTS/CN=5F019C8179304045ACD61BC05B571FB0-NEWHOUSE, KATHLEEN]  
**Sent:** 5/18/2015 8:12:02 PM  
**To:** Prof. Giorgio Assennato [g.assennato@arpa.puglia.it]  
**Subject:** RE: BaP Inhalation Cancer Unit Risk

Dear Dr. Assennato,

Thank you for your email and I apologize for the delay of my response. I agree this is a very interesting issue. I think at the center of the matter is that there are different approaches for assessing the carcinogenicity of mixtures of PAHs, each with associated advantages and disadvantages. EPA and CalEPA have each developed strategies that use an inhalation cancer risk value for BaP alone (derived from an animal study) and have developed corresponding relative potency factors (RPFs) or potency equivalency factors (PEFs) to estimate the carcinogenic potency of several other carcinogenic PAHs (where data are available). These two pieces, when coupled with PAH concentrations in the air, are used to estimate the carcinogenic risk of PAH mixtures.

It looks like the WHO is using BaP as an index substance to represent the carcinogenicity of the *whole mixture* of PAHs using EPA's risk estimate based on humans exposed to a type of PAH mixture (more specifically the benzene soluble fraction of coke oven emissions) and then applying an adjustment for the percentage of BaP in the benzene soluble fraction. My impression is that the WHO number for BaP is used to represent the risk from the *whole PAH mixture* and therefore, it would not be appropriate to compare that number to the EPA or CalEPA IURs derived for BaP alone as these risk estimates do not account for the other carcinogenic components for the PAH mixture.

In my opinion, each of these approaches to estimate carcinogenic risk from exposure to PAH mixtures has its own set of assumptions and uncertainties and associated advantages and disadvantages.

-Kathleen Newhouse

Kathleen Newhouse, MS, DABT  
National Center for Environmental Assessment | Office of Research and Development  
U.S. Environmental Protection Agency

---

**From:** Prof. Giorgio Assennato [mailto:g.assennato@arpa.puglia.it]  
**Sent:** Wednesday, April 15, 2015 11:51 AM  
**To:** Newhouse, Kathleen  
**Subject:** BaP Inhalation Cancer Unit Risk

---

**Da:** Prof. Giorgio Assennato [mailto:g.assennato@arpa.puglia.it]  
**Inviato:** martedì 14 aprile 2015 14:12  
**A:** 'Murphy.Deirdre@epa.gov'  
**Oggetto:** BaP Inhalation Cancer Unit Risk

---

**Oggetto:** I:BaP Inhalation Cancer Unit Risk

Dear dr. Newhouse,

I'm an old Hopkins graduate, full professor of Occupational Medicine at the local school of medicine and currently director of the regional environmental protection agency in Apulia, Italy. Recently, our agency was requested to carry out a health risk assessment in the area of Taranto (around 230.000 inhabitants( where the largest European integrated cycle steel plant is located along with other sources ( an oil refinery, a cement plant, urban waste and hospital waste incinerators). In the evaluation of lifetime cancerogenic risk, we had to use the WHO IUR for BaP which is almost two orders of magnitude larger than the CalEPA and USEPA ( $0.87 \times 10^{-4}$  /ng/m<sup>3</sup>) **vs. CalEPA ( $1.1 \times 10^{-6}$  /ng/m<sup>3</sup>)**.. WHO keeps on publishing its old BaP IUR in the recent air quality guidelines. I think we should update the BaP IUR but we cannot do it unless a formal criticism by scientific authorities is expressed.

What's your opinion on this intriguing issue?

Thank you so much for your attention,

Giorgio Assennato MD,ScD,MPH

Director, ARPA Puglia, Italy